



Missouri Adaptive Enterprise Architecture

August 2002
Version: 1

State of Missouri

Executive Primer

Prepared By

State of Missouri
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Letter of Introduction



State of Missouri

August 28, 2001

Bob Holden
Governor

Department Officials:

Gerald E. Wethington
Chief Information Officer

The State of Missouri has taken an important step in moving to the information age, the development of Missouri's Adaptive Enterprise Architecture, MAEA. Governments have grown dependant upon technology over the last 3 decades. As government introduced information technology it did so with little or no regard for a common architecture or common standards. Technology was often acquired and then a search began for some business function that could benefit from the acquisition. Transforming the culture of government to recognize information technology as a core business function is not an easy task, but an essential task none-the-less. The State of Missouri has initiated its Adaptive Enterprise Architecture program by focusing on the governance of architecture and developing a blueprint for success. The MAEA Manual and the Primer offer the guidance necessary to begin to change the culture of Missouri state government with respect to information technology investment and management.

Because architecture is such a significant change from the days of information technology silos the path for development, adoption and implementation requires the participation of all affected agencies. The MAEA will be successful in Missouri because of the approach being taken within the information technology community, an approach of participatory development and consensus development on governance, principles, guidelines, technology and standards. Missouri state agencies have willingly contributed staff time and expertise in the development of Missouri's adaptive enterprise architecture. The MAEA and the Primer are the results of their collaborative efforts and a demonstration of the progress that can be made when agencies work together to chart the course for Missouri state government in the information age.

I applaud the efforts of the Information Technology Advisory Board and both the Architecture Review Committee and Architecture Technical Committee in reaching this significant milestone. I encourage every member of Missouri's information technology community to review the MAEA and the Primer and to embrace the concepts put forth as they approach their day-to-day activities. The future of Missouri government will depend, in part, on the quality of its information technology program. The quality of that program will depend upon Missouri's ability to recognize information technology as a core business function and to manage the investments made as an enterprise asset. The tools to assist begin with this MAEA Manual and the Primer.

Sincerely,

A handwritten signature in black ink that reads "Gerry Wethington".

Gerald E. Wethington
Chief Information Officer

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Executive Primer for the Missouri Adaptive Enterprise Architecture Program

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Introduction

In today's world, information technology is a critical enabling factor that drives industry, commerce, education, and government. Advances in technology during the past few decades have dramatically changed the way individuals, businesses, and government organizations process, store, and transmit information. For example, in the past, birth, death, marriage, tax, and land ownership records that a government office must maintain might require an entire floor of a large building, hundreds of file cabinets, thousands of file folders, and dozens of personnel to process, store, and manage. Today, all that information can reside in one system, located in a centralized computer facility. Individuals can now locate, duplicate, and transmit one page of that information in a minute or two to any location on the globe.

Because these new capabilities exist, our expectations have changed. Thanks to new technologies such as the Internet, we can buy St. Louis Rams football tickets, check the

weather in Jefferson City, and make several stock market transactions in a few minutes at home before breakfast. Because the world of commerce offers such convenience and responsiveness, we have come to expect the same from government. Due to public demand, and because significant cost savings can be realized at the same time that services are dramatically improved, government has no choice but to implement appropriate information technologies. The downside of this reality is that difficulties and complexities always accompany the introduction, coordination, and management of technology. This is especially true in large organizations such as state governments that struggle to meet the various needs of many interrelated entities.

The Office of Information Technology (OIT) is responsible for information technology policy and strategic planning in the State of Missouri with emphasis on information sharing and interoperability among agencies and business partners. This responsibility was defined in the Information Systems Strategic Plan that was developed in conjunction with Missouri's Information Technology Advisory Board (ITAB). One of the specific primary objectives of the plan is to develop a State of Missouri adaptive enterprise architecture that facilitates information sharing across departmental lines of responsibility. This objective has resulted in the development of the Missouri Adaptive Enterprise Architecture plan.

Architecture will allow Missouri state government to act as a single entity, an enterprise, with respect to information technology.

What is Architecture?

Information technology (IT) architecture may be thought of as the collection of standards and specifications that define how the information systems of an organization are and will be built. Therefore, the Missouri Adaptive Enterprise Architecture (MAEA) is the dynamic data that defines and categorizes the products, configurations, and compliances (guidelines, standards, and/or legislation) regarding the information technology in use or being considered within the State of Missouri.

Enterprise architecture is the blueprint for allowing information to flow from agency to agency, just as water flows through the pipes and electricity flows through the wiring within the infrastructure of a well-planned city. In the past, various entities within organizations, such as agencies of a state government, solved their particular IT problems by implementing systems and technologies independently of one another. The existing culture of the IT environment was born out of essentially a federation of agencies implementing IT solutions as necessary to perform their business with little to no consideration of sharing of information and maximizing the return on IT investment outside of the agency. But over time, it has become clear that sharing information and IT solutions across organizational boundaries and defining enterprise level products and standards increases efficiencies, lowers costs, improves service to customers, and allows the State to appropriately protect State resources, State systems, and the privacy of the citizens of the State.” Thus the need for enterprise architecture was born.

Unfortunately implementation of enterprise architecture is not as simple as throwing a switch. It is necessary to change from this existing culture to one that utilizes IT investment to empower the enterprise. Executives, IT Managers, project teams and service teams must first understand the advantages provided by enterprise architecture, believe in them, commit to implementation, and most of all adjust to a culture that makes

enterprise architecture a part of the way we plan and do business everyday.

Enterprise architecture covers the broad spectrum of technology environments, including networks, applications, databases, messaging, interfacing, middleware, and security among others. The evolution of new products, technology trends, business trends, and user demands will require a constant update to architectural standards to ensure that data and services remain accessible. Compliance with architectural standards will evolve over a long period of time.

Enterprise architecture must be adaptive and evolve to accommodate changes in business and technology.

Where Are We Today?

OIT, the Information Technology Advisory Board (ITAB), and the Architecture Review Committee (ARC) have made the investment and completed development of the MAEA program. The program is now ready for implementation. The enterprise architecture plan developed is documented in the MAEA Manual. The Manual presents the guidance and approach for implementation of the MAEA in the State of Missouri. Included in the Manual are the governance, processes, templates and training associated with developing the details of the architecture.

The end result will be a more effective use of State resources and a more efficient delivery of services.

What Are the Benefits of Adopting Enterprise Architecture?

More and more government enterprises are recognizing the need to share information. Government at every level reaps the highest benefits from sharing common ideas, common approaches, and the sharing of information and technology.

Repetitive use of common and adaptive enterprise architecture standards helps to identify and mitigate project risks, increase project success rates, provide the enterprise with interchangeable staff and deliver solutions more quickly. Implementing enterprise architecture standards provides a significant benefit in procurement and purchasing. Standards will reduce the variety of items purchased and allow the enterprise to consolidate buying power. The reduced variety also minimizes support and training costs because it results in a more focused work force. The state of Kansas has reduced its IT project procurement cycle by an average of 41% since its implementation of enterprise architecture and incorporation of established standards as baseline requirements for their procurement efforts.”

Simply stated, adopting adaptive enterprise architecture will greatly enhance government’s ability to deliver effective and timely services and to support agencies in their efforts to improve the overall functioning of government. Sharing information, maximizing resource investment, increasing technology reuse opportunities, and meeting the public’s ever-increasing expectations for electronic access to government information and services are major motivating factors driving the need for implementation of common enterprise architecture and standards.

Who Else is Implementing IT Architecture?

Missouri is hardly alone in its endeavor to implement a statewide IT architecture. As previously mentioned, Kansas has already adopted state architecture standards. Maryland is currently in the process of choosing a consultant to help develop its enterprise architecture. The Montana State Legislature passed the Montana Information Technology Act in April 2001, setting in motion a number of parallel efforts designed to assess, direct, and manage the adoption of information technology.

At the national level, NASCIO, an association of state Chief Information Officers, pursues the goal of information sharing across state and agency boundaries. NASCIO recently released *The Adaptive Enterprise Architecture Tool-Kit*, which includes its Adaptive Enterprise Architecture model and presents its architectural framework for integrated information and data sharing between state and local government entities.

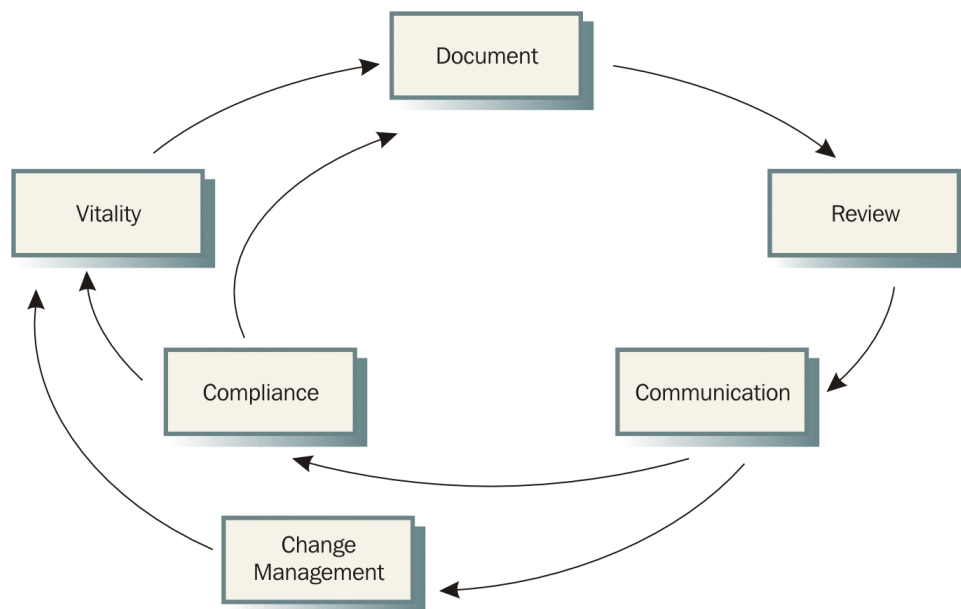
At the Federal government level, Executive Order 13011, *Federal Information Technology*, established the Chief Information Officers (CIO) Council and the Clinger-Cohen Act of 1996 assigned the CIOs with the responsibility to develop information technology architectures. The Federal Enterprise Architecture Framework (FEAF) consists of various approaches, models, and definitions for communicating the overall organization and relationships of architecture components required for developing and maintaining a Federal Enterprise Architecture. This architecture will serve as a reference point to facilitate the efficient and effective coordination of common business processes, information flows, systems, and investments among Federal agencies and other government entities. In time, Federal business processes and systems will operate seamlessly in an enterprise architecture that provides models and standards that identify and define the information services used throughout the Federal government.

Who Will Participate in Enterprise Architecture and Take Responsibility for It?

Architecture governance is the responsibility of executives as well as stakeholders such as citizens, businesses, employees, and other organizations throughout the enterprise. Governance consists of the leadership, organizational structures, direction, and processes that ensure that information technology sustains and extends the enterprise's mission, strategies, and objectives in a planned manner.

The Missouri Adaptive Enterprise Architecture is governed by a well-defined set of roles, responsibilities, and processes. Like the architecture itself, these areas must be well managed to ensure the effectiveness of the overall architecture. The roles include committees and executives from business and IT whose functions are strategic to the technical committees that make recommendations concerning specific products or standards.

There are five key processes associated with architectural governance: Documentation, Review, Communication, Compliance, and Vitality. The following graphic identifies these processes and their relationships.

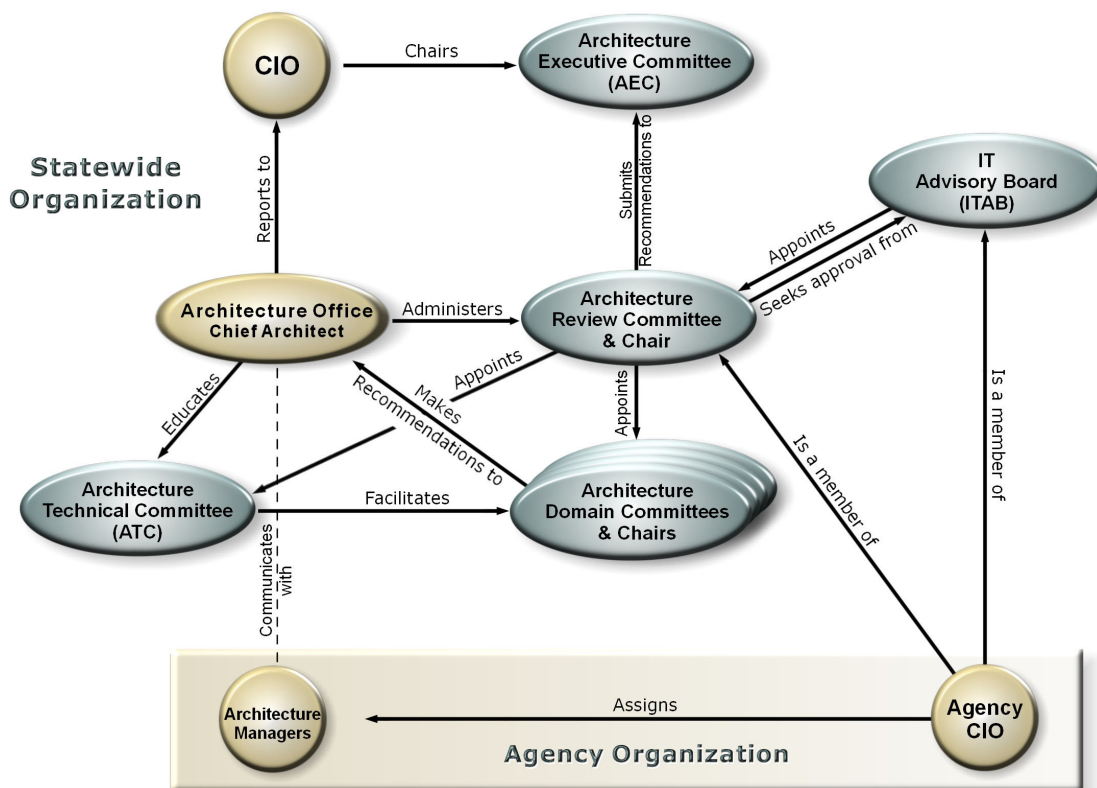


Architecture Process Overview

The governance Change Management process is an additional documented process utilized to identify suggested changes to the architecture governance processes, organizational structure, relationships, and responsibilities. The touch points to the procurement process and project management processes are also documented within the MAEA Manual to show their relevance in enabling the architecture to be viable and adaptable.

The support of enterprise architecture requires the involvement of personnel in a variety of

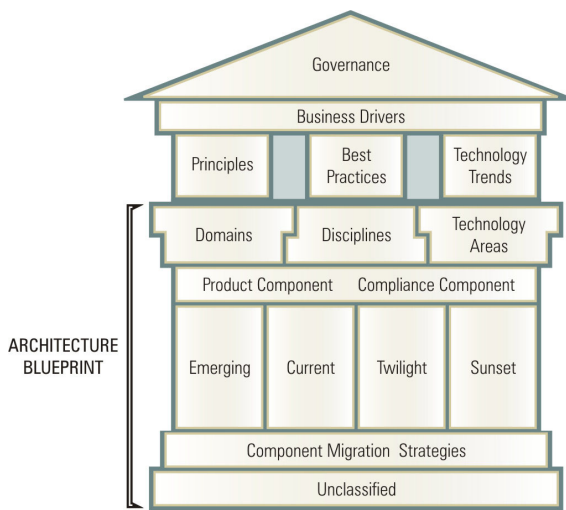
roles and responsibilities. The State of Missouri has identified the roles and organizational duties at both the State and agency level. The following graphic illustrates the “Missouri Adaptive Enterprise Architecture Governance Model” which identifies key organizational roles and management responsibilities for the MAEA. Further discussion of the identified roles and responsibilities is provided in the MAEA Manual.



Missouri Adaptive Enterprise Architecture Governance Model

What Is the MAEA Based On?

The architecture efforts within the State of Missouri are intended to identify and document existing systems, infrastructure, and components, as well as create a framework for the development of new systems, components, applications, and major modifications to existing systems. The following graphic offers one way of conceptualizing the enterprise architecture framework.



Enterprise Architecture Framework

The “roof” of the enterprise architecture framework represents the roles and responsibilities of the personnel who support and govern the enterprise architecture. Their efforts are driven and guided by the business needs of the enterprise. The enterprise architecture pillars (principles, best practices, and technology trends) are overarching; they hold true throughout the architecture. The domains, disciplines, and technology areas are the building blocks that make up the architecture. They are its foundation and its logical divisions, such as privacy, security, and the IT infrastructure. The process of documenting the architecture blueprint classifies product and compliance components into categories such as emerging, current,

twilight, and sunset including documenting critical component migration strategies.

One of the key factors in developing an adaptive enterprise architecture is the understanding of the enterprise business, which means the business of each State agency and organization. The enterprise business drivers document the business direction of the enterprise and help to ensure that the application of information technology supports the business of the State and its individual agencies. The MAEA Manual identifies the enterprise business drivers that guide the MAEA program, some examples include:

- The State of Missouri will make information easily accessible and readily available as needed and wherever needed, for both the citizens of Missouri and State employees.
- The State will deliver services in a fiscally accountable fashion.
- All State agencies must cooperate and collaborate in delivering their services.
- As Missouri government moves from older process models to 21st century process models, information technology will be a critical success factor in the creation, maintenance, and delivery of services to all citizens.

In IT architecture, the enterprise architecture principles are the general rules that hold true across the architecture. In a sense, principles define the spirit of the architecture, in that they are an attempt to capture the thinking behind it. Best practices identify industry processes related to the implementation of the architecture. Technology trends within the industry have an effect on the deployment of information technology. Identifying these trends and having an awareness of their impact will allow IT decision makers to develop more informed, effective decisions: The MAEA Manual identifies the principles, best practices, and technology trends that guide the MAEA.



Where Can Missouri's Adaptive Enterprise Architecture be Found?

The MAEA is currently under development. The MAEA Manual provides the roadmap for this development effort. As Missouri's enterprise architecture is constructed, its guidelines and standards that define and categorize the products, configurations, and compliances regarding the information technology in use or being considered within the State of Missouri will be documented in the MAEA Blueprint.

The MAEA Blueprint, when completed, will contain the result of the EA efforts defining state-wide products and standards and will be the single source that all IT professionals across the State of Missouri will use for guidance on the full range of IT procurement, procedural, and development issues. Questions that State IT professionals may have, such as which product to purchase, what network configuration to implement, or when to retire an older system, plus many other related questions, will be answered by the MAEA Blueprint.

But much work is still required to complete the MAEA Blueprint. The MAEA Manual outlines the process of establishing working groups called Domain Committees composed of appropriate IT subject matter experts who will use prescribed processes to assess unclassified information technologies and classify them into the State standards documented in the Blueprint. These standards will include a variety of information alerting State IT professionals when their specific IT systems are in compliance with the State architecture standards and which directions to move in when their systems are not. But the Blueprint will not hinder State IT professionals who know their particular systems best from developing individual compliance and migration strategies. Details of the structure and initial MAEA Blueprints are documented in the MAEA Manual Appendix.

The MAEA Manual also describes the process for educating and preparing the State agency IT personnel who will participate in the Domain Committees and are affected by the architecture in general. The State of Missouri's educational approach is organized around three sessions, the first of which is an architecture primer that provides an overview of architecture and identifies the approach that the State of Missouri is taking for development and maintenance of architecture for the State. This session will not address specific issues, but is intended to provide an understanding of the concepts of architecture.

The second set of sessions will be facilitated sessions that are specific to the MAEA domains. Each session will define the specific domain and provide the essential understanding of how to complete the documentation of standards and standard products, etc. associated with the domain.

The third set of sessions will include facilitated working sessions that are also domain specific. In these sessions the actual components of the MAEA Blueprint will be derived and documented.



What Happens Next?

Next, we must get the word out, refine our path for implementation, and commit to enterprise architecture as the cornerstone for leveraging technology innovations to fulfill the expectations of the citizens and employees of the State of Missouri.

For the Missouri Adaptive Enterprise Architecture program to succeed, information about it must be communicated to all stakeholders, especially State agency professionals who will actually work with it and make decisions based on it. A genuine commitment to the MAEA program is necessary for its success, and this commitment will grow through awareness and understanding of the MAEA.